

SEQUENCE LISTING

<110> SAKI, Mayumi
 NONAKA, Hiromi
 MIYAJI, Hiromasa
 ICHIKAWA, Shunji
 TAKASHIMA, Chiemi
 MATSUMURA, Tsutomu
 ARAI, Hitoshi
 SASAKI, Katsutoshi
 KOBATAKE, Choei
 TSUKUMO, Yukihiro
 IIDA, Kyoichiro
 KUBOYAMA, Takeshi
 MANABE, Haruhiko

<120> Agent for prevention and/or treatment of itching

<130> 506.44793X00

<140> US/10/525,324

<141> 2005-02-22

<150> JP 2002/241522

<151> 2002-08-22

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<170> PatentIn Ver 2.1

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Pro Thr Asn Cys Leu Ala Leu Trp Ala Ala Tyr Arg Gln Val Gln Gln
35 40 45
Arg Asn Glu Leu Gly Val Tyr Leu Met Asn Leu Ser Ile Ala Asp Leu
50 55 60
Leu Tyr Ile Cys Thr Leu Pro Leu Trp Val Asp Tyr Phe Leu His His
65 70 75 80
Asp Asn Trp Ile His Gly Pro Gly Ser Cys Lys Leu Phe Gly Phe Ile
85 90 95
Phe Tyr Thr Asn Ile Tyr Ile Ser Ile Ala Phe Leu Cys Cys Ile Ser
100 105 110
Val Asp Arg Tyr Leu Ala Val Ala His Pro Leu Arg Phe Ala Arg Leu
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Arg Arg Val Lys Thr Ala Val Ala Val Ser Ser Val Val Trp Ala Thr
130 135 140
Glu Leu Gly Ala Asn Ser Ala Pro Leu Phe His Asp Glu Leu Phe Arg
145 150 155 160
Asp Arg Tyr Asn His Thr Phe Cys Phe Glu Lys Phe Pro Met Glu Gly
165 170 175
Trp Val Ala Trp Met Asn Leu Tyr Arg Val Phe Val Gly Phe Leu Phe
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Arg Gly Ser Val Ser Thr Gln Arg Gln Glu Lys Ala Lys Ile Lys Arg

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 Met Gly Asn
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cac	acg	tgg	gag	ggc	tgc	cac	gtg	gac	tcg	cgc	gtg	gac	cac	ctc	ttt	886
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Pro	Pro	Ser	Leu	Tyr	Ile	Phe	Val	Ile	Gly	Val	Gly	Leu	Pro	Thr	Asn	
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Cys	Leu	Ala	Leu	Trp	Ala	Ala	Tyr	Arg	Gln	Val	Gln	Gln	Arg	Asn	Glu	
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Cys	Thr	Leu	Pro	Leu	Trp	Val	Asp	Tyr	Phe	Leu	His	His	Asp	Asn	Trp					
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atc	cac	ggc	ccc	ggg	tcc	tgc	aag	ctc	ttt	ggg	ttc	atc	ttc	tac	acc	1126				
Ile	His	Gly	Pro	Gly	Ser	Cys	Lys	Leu	Phe	Gly	Phe	Ile	Phe	Tyr	Thr					
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Tyr	Leu	Ala	Val	Ala	His	Pro	Leu	Arg	Phe	Ala	Arg	Leu	Arg	Arg	Val					
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gcc	aac	tcg	gcg	ccc	ctg	ttc	cat	gac	gag	ctc	ttc	cga	gac	cgc	tac	1318				
Ala	Asn	Ser	Ala	Pro	Leu	Phe	His	Asp	Glu	Leu	Phe	Arg	Asp	Arg	Tyr					
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Leu	Met	Leu	Leu	Ser	Tyr	Arg	Gly	Ile	Leu	Arg	Ala	Val	Arg	Gly	Ser					
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Phe	Glu	Glu	Arg	Val	Phe	Ser	Ala	Tyr	His	Ser	Ser	Leu	Ala	Phe	Thr					
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 Gly Ser Trp Ala Ala Thr Pro Pro Ser Gln Gly Asp Gln Val Gln Leu
 340 345 350 355

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 35 40 45
 Arg Gln His Asn Glu Leu Gly Val Tyr Leu Met Asn Leu Ser Ile Ala
 50 55 60
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 His His Asp Asn Trp Ile His Gly Pro Gly Ser Cys Lys Leu Phe Gly
 85 90 95
 Phe Ile Phe Tyr Ser Asn Ile Tyr Ile Ser Ile Ala Phe Leu Cys Cys
 100 105 110
 Ile Ser Val Asp Arg Tyr Leu Ala Val Ala His Pro Leu Arg Phe Ala
 115 120 125
 Arg Leu Arg Arg Val Lys Thr Ala Val Ala Val Ser Ser Val Val Trp
 130 135 140
 Ala Thr Glu Leu Gly Ala Asn Ser Ala Pro Leu Phe His Asp Glu Leu
 145 150 155 160

Phe Arg Asp Arg Tyr Asn His Thr Phe Cys Phe Glu Lys Phe Pro Met
 165 170 175
 Glu Arg Trp Val Ala Trp Met Asn Leu Tyr Arg Val Phe Val Gly Phe
 180 185 190
 Leu Phe Pro Trp Ala Leu Met Leu Leu Cys Tyr Arg Gly Ile Leu Arg
 195 200 205
 Ala Val Gln Ser Ser Val Ser Thr Glu Arg Glu Glu Lys Val Lys Ile
 210 215 220
 Lys Arg Leu Ala Leu Ser Leu Ile Ala Ile Val Leu Val Cys Phe Ala
 225 230 235 240
 Pro Tyr His Ala Leu Leu Leu Ser Arg Ser Ala Val Tyr Leu Gly Arg
 245 250 255
 Pro Trp Asp Cys Gly Phe Glu Glu Arg Val Phe Ser Ala Tyr His Ser
 260 265 270
 Ser Leu Ala Phe Thr Ser Leu Asn Cys Val Ala Asp Pro Ile Leu Tyr
 275 280 285
 Cys Leu Val Asn Glu Gly Ala Arg Ser Asp Val Ala Lys Ala Leu His
 290 295 300
 Asn Leu Leu Arg Phe Leu Ala Ser Asn Lys Pro Glu Glu Met Ala Asn
 305 310 315 320
 Ala Ser Leu Thr Leu Glu Thr Pro Leu Thr Ser Lys Arg Ser Thr Thr
 325 330 335
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 Val Asp His Leu Phe Pro Pro Ser Leu Tyr Ile Phe Val Ile Gly Val
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 Gly Leu Pro Thr Asn Cys Leu Ala Leu Trp Ala Ala Tyr Arg Gln Val
 35 40 45
 cgc caa cac aat gag ctg ggc gtc tac ctg atg aac ttg agc att gca 192
 Arg Gln His Asn Glu Leu Gly Val Tyr Leu Met Asn Leu Ser Ile Ala
 50 55 60
 gac ctg ctg tac atc tgc act ttg ccg ctg tgg gtc gac tac ttc ctc 240
 Asp Leu Leu Tyr Ile Cys Thr Leu Pro Leu Trp Val Asp Tyr Phe Leu

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gca Ala 210	gtg Val	cag Gln	agc Ser	agt Ser	gtg Val	tcc Ser 215	acc Thr	gag Glu	cgc Arg	cag Glu	gag Glu	aaa Lys	gtc Val	aag Lys	atc Ile	672
aaa Lys 225	cgt Arg	ctg Leu	gcc Ala	ctg Leu	agc Ser	ctc Leu	atc Ile	gcc Ala	att Ile	gtg Val 235	ctg Leu	gtg Val	tgc Cys	ttt Phe	gcg Ala 240	720
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ccc Pro	tgg Trp	gac Asp	tgt Cys 260	ggc Gly	ttc Phe	gag Glu	gag Glu	cga Arg 265	gtc Val	ttt Phe	tct Ser	gcc Ala	tac Tyr	cac His	agc Ser	816
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tgc Cys 290	ctg Leu	gtc Val	aac Asn	gag Glu	ggt Gly	gcc Ala 295	cgc Arg	agt Ser	gat Asp	gtg Val	gcc Ala 300	aag Lys	gcc Ala	ctg Leu	cac His	912
aac Asn 305	ctc Leu	ctc Leu	cgc Arg	ttc Phe	ctg Leu	gcc Ala 310	agc Ser	aac Asn	aag Lys	ccc Pro 315	cag Gln	gag Glu	atg Met	gcc Ala	aat Asn 320	960
gct Ala	tcc Ser	ctc Leu	acc Thr 325	ctg Leu	gag Glu	aca Thr	ccc Pro	ttg Leu 330	acc Thr	tcc Ser	aag Lys	agg Arg	agc Ser	acc Thr 335	acc Thr	1008

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 340 345 350

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 20 25 30
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 35 40 45
 Arg Gln Arg Asn Glu Leu Gly Val Tyr Leu Met Asn Leu Ser Ile Ala
 50 55 60
 Asp Leu Leu Tyr Ile Cys Thr Leu Pro Leu Trp Val Asp Tyr Phe Leu
 65 70 75 80
 His His Asp Asn Trp Ile His Gly Pro Gly Ser Cys Lys Leu Phe Gly
 85 90 95
 Phe Ile Phe Tyr Ser Asn Ile Tyr Ile Ser Ile Ala Phe Leu Cys Cys
 100 105 110
 Ile Ser Val Asp Arg Tyr Leu Ala Val Ala His Pro Leu Arg Phe Ala
 115 120 125
 Arg Leu Arg Arg Val Lys Thr Ala Val Ala Val Ser Ser Val Val Trp
 130 135 140

Ala Thr Glu Leu Gly Ala Asn Ser Ala Pro Leu Phe His Asp Glu Leu
145 150 155 160

Phe Arg Asp Arg Tyr Asn His Thr Phe Cys Phe Glu Lys Phe Pro Met
165 170 175

Glu Arg Trp Val Ala Trp Met Asn Leu Tyr Arg Val Phe Val Gly Phe
180 185 190

Leu Phe Pro Trp Ala Leu Met Leu Leu Cys Tyr Arg Gly Ile Leu Arg
195 200 205

Ala Val Gln Ser Ser Val Ser Thr Glu Arg Gln Glu Lys Val Lys Ile
210 215 220

Lys Arg Leu Ala Leu Ser Leu Ile Ala Ile Val Leu Val Cys Phe Ala
225 230 235 240

Pro Tyr His Ala Leu Leu Leu Ser Arg Ser Ala Val Tyr Leu Gly Arg
245 250 255

Pro Trp Asp Cys Gly Phe Glu Glu Arg Val Phe Ser Ala Tyr His Ser
260 265 270

Ser Leu Ala Phe Thr Ser Leu Asn Cys Val Ala Asp Pro Ile Leu Tyr
275 280 285

Cys Leu Val Asn Glu Gly Ala Arg Ser Asp Val Ala Lys Ala Leu His
290 295 300

Asn Leu Leu Arg Phe Leu Ala Ser Asn Lys Pro Gln Glu Met Ala Asn
305 310 315 320

Ala Ser Leu Thr Leu Glu Thr Pro Leu Thr Ser Lys Arg Ser Thr Thr
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Gly Lys Thr Ser Gly Ala Val Trp Ala Val Pro Pro Thr Ala Gln Gly
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Asp Gln Val Pro Leu Lys Val Leu Leu Pro Pro Ala Gln
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gtg gac cac ctc ttc cca cca tcc ctc tac atc ttc gtc atc ggg gtg	96
Val Asp His Leu Phe Pro Pro Ser Leu Tyr Ile Phe Val Ile Gly Val	
20 25 30	
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Gly Leu Pro Thr Asn Cys Leu Ala Leu Trp Ala Ala Tyr Arg Gln Val	
35 40 45	
cgc cag cgc aat gag ctg ggc gtc tac ctg atg aac ttg agc atc gca	192
Arg Gln Arg Asn Glu Leu Gly Val Tyr Leu Met Asn Leu Ser Ile Ala	
50 55 60	
gac ctg ctg tac atc tgt acg ctg ccg ctg tgg gtc gac tac ttc ctc	240

Asp 65	Leu	Leu	Tyr	Ile	Cys 70	Thr	Leu	Pro	Leu	Trp 75	Val	Asp	Tyr	Phe	Leu 80	
cac His	cat His	gac Asp	aac Asn	tgg Trp 85	atc Ile	cac His	ggc Gly	ccc Pro	ggc Gly 90	tcc Ser	tgc Cys	aag Lys	ctc Leu	ttt Phe 95	ggc Gly	288
ttc Phe	atc Ile	ttc Phe	tac Tyr 100	agc Ser	aac Asn	atc Ile	tac Tyr	atc Ile 105	agc Ser	atc Ile	gcc Ala	ttc Phe	ctg Leu 110	tgc Cys	tgc Cys	336
atc Ile	tcc Ser	gtg Val 115	gac Asp	cgc Arg	tac Tyr	ctg Leu	gct Ala	gtg Val 120	gcc Ala	cat His	ccg Pro	ctg Leu	cgc Arg	ttt Phe	gcg Ala	384
cgc Arg	ctg Leu 130	cgc Arg	cgg Arg	gtc Val	aag Lys	aca Thr 135	gca Ala	gta Val	gct Ala	gtg Val	agc Ser 140	tcc Ser	gtg Val	gtc Val	tgg Trp	432
gcc Ala 145	acc Thr	gag Glu	cta Leu	ggc Gly 150	gcc Ala 150	aac Asn	tcg Ser	gca Ala	ccg Pro	ctc Leu 155	ttt Phe	cat His	gac Asp	gag Glu 160	ctc Leu	480
ttt Phe	cgt Arg	gat Asp	cgc Arg	tac Tyr 165	aac Asn	cac His	acc Thr	ttc Phe	tgc Cys 170	ttc Phe	gag Glu	aag Lys	ttc Phe	ccc Pro 175	atg Met	528
gag Glu	cgc Arg	tgg Trp 180	gtg Val	gcc Ala	tgg Trp	atg Met	aac Asn	ctg Leu 185	tac Tyr	cgc Arg	gtc Val	ttt Phe	gtg Val 190	ggg Gly	ttc Phe	576
ctc Leu	ttc Phe	ccc Pro 195	tgg Trp	gca Ala	ctc Leu	atg Met	ttg Leu 200	ctg Leu	tgc Cys	tac Tyr	cgc Arg	ggc Gly 205	atc Ile	ctg Leu	cgg Arg	624
gcc Ala 210	gta Val	cag Gln	agc Ser	agt Ser	gtg Val	tcc Ser 215	acc Thr	gag Glu	cgc Arg	cag Gln	gag Glu 220	aaa Lys	gtc Val	aag Lys	atc Ile	672
aaa Lys 225	cgc Arg	ctg Leu	gcc Ala	ctg Leu	agc Ser 230	ctc Leu	atc Ile	gcc Ala	atc Ile	gtg Val 235	ctg Leu	gtg Val	tgc Cys	ttt Phe	gca Ala 240	720
ccc Pro	tac Tyr	cat His	gct Ala	ctc Leu 245	ttg Leu	ctg Leu	tct Ser	cgc Arg	agc Ser 250	gct Ala	gtc Val	tat Tyr	ctg Leu	ggc Gly 255	cgg Arg	768
ccc Pro	tgg Trp	gac Asp	tgt Cys 260	ggc Gly	ttc Phe	gag Glu	gag Glu	cga Arg 265	gtc Val	ttc Phe	tct Ser	gcc Ala	tac Tyr 270	cac His	agc Ser	816
tcc Ser	cta Leu 275	gcc Ala	ttc Phe	acc Thr	agc Ser	ctc Leu	aat Asn 280	tgc Cys	gtg Val	gct Ala	gac Asp	ccc Pro 285	atc Ile	ctc Leu	tac Tyr	864
tgc Cys 290	ctg Leu	gtc Val	aac Asn	gag Glu	ggc Gly 295	cgt Ala	agt Arg	gac Ser	gtg Val	gcc Ala 300	aaa Lys	gcc Ala	ctg Leu	cac His		912
aac Asn 305	ctc Leu	ctc Leu	cgc Arg	ttc Phe	ctg Leu 310	gcc Ala	agc Ser	aac Asn	aag Lys	ccc Pro 315	cag Gln	gag Glu	atg Met	gcc Ala	aat Asn 320	960
gct Ala	tcc Ser	ctc Leu	acc Thr 325	ctg Leu	gag Glu	aca Thr	cca Pro	ttg Leu	acc Thr 330	tcc Ser	aag Lys	agg Arg	agc Ser	acc Thr 335	acc Thr	1008

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Gly	Lys	Thr	Ser	Gly	Ala	Val	Trp	Ala	Val	Pro	Pro	Thr	Ala	Gln	Gly	
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gac	cag	gtg	cca	ctg	aag	gtg	ctg	ctg	ccc	ccg	gca	cag	tga			1098
Asp	Gln	Val	Pro	Leu	Lys	Val	Leu	Leu	Pro	Pro	Ala	Gln				
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